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1999 Annual Report

The Air Pollution Control Program produces an annual report to provide Missouri residents information about the status of air quality in the state. The publication is made available here in electronic format. The publication is divided into chapters for quicker download.

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- [Introduction and Table of Contents](#) (05/00) 24 KB
- [Chapter 1: 1999 Air Quality Highlights](#) (05/00) 71 KB
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Missouri
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Air Pollution Control Program Report 1999



**Missouri Department of Natural Resources
Division of Environmental Quality**



MISSOURI DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

REGIONAL AND SATELLITE OFFICES

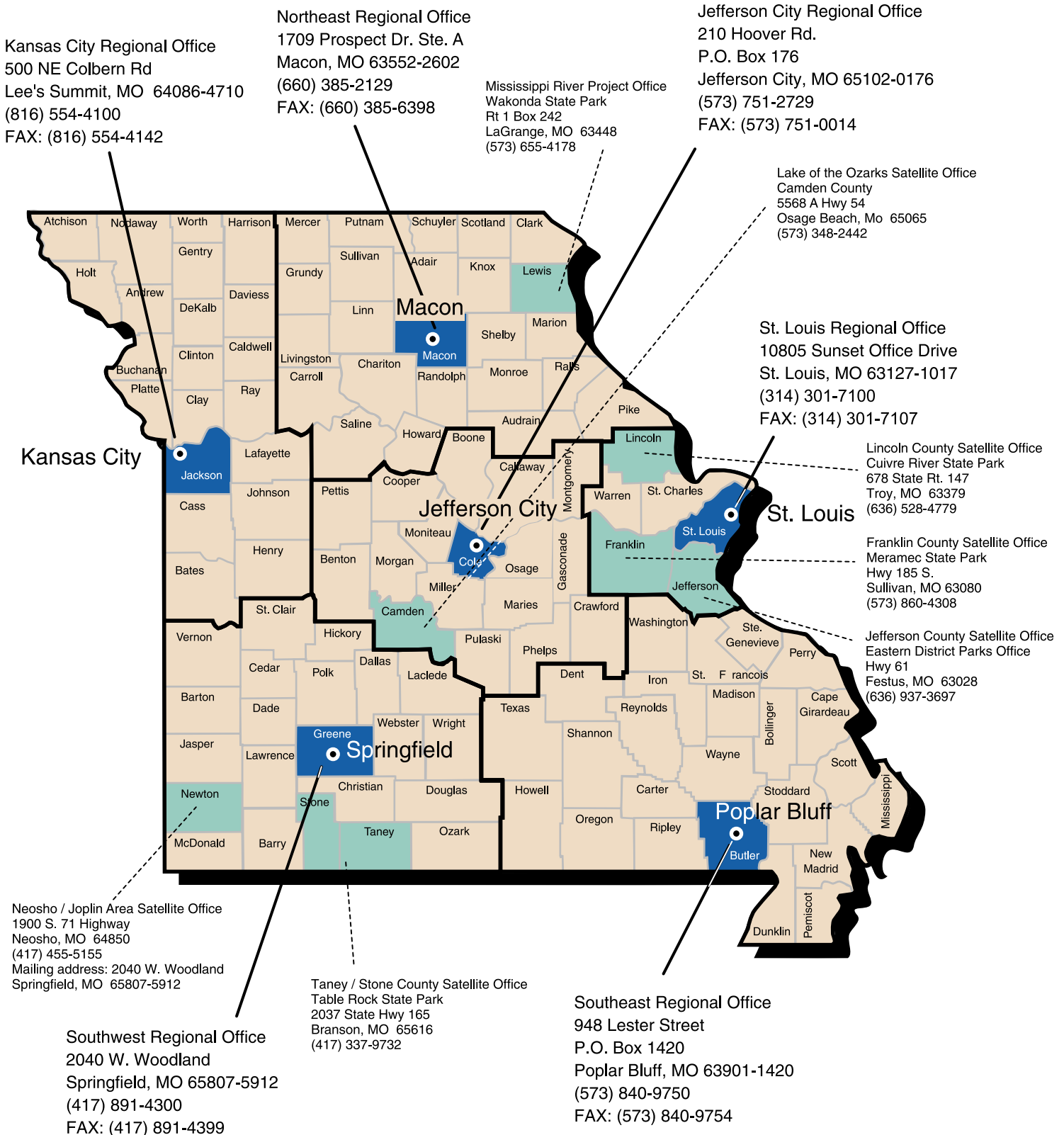


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Introduction

He steps up to the plate, his jaw set firmly. Tens of thousands watch quietly as he lifts the heavy bat, waiting for that powerful swing. He takes a deep breath before launching the tiny sphere into orbit. CRACK!

Missouri's air sustains us in everything we do. Whether working in a garden, waiting for a bus or hitting homeruns, clean air provides us life energy. The Missouri Department of Natural Resources' (DNR) Air Pollution Control Program (APCP) continues to look for new ways to improve the quality of air for Missouri's residents.

As Missouri begins a new millennium, APCP will once again rely upon the support of citizens, businesses, industry and federal, state and local governments to keep the air clean for all Missouri's residents. APCP hopes that you will continue monitoring rules and legislation regarding air pollution, and contact us when you have questions and concerns. It is also important that citizens inform DNR of unusual odors, emissions or smoke. To provide clean air across the state, it will take an active involvement by all Missouri citizens. Through regular tune-ups, use of low-solvent products, composting of yard waste and proper disposal of waste that cannot be composted, each person's contribution is multiplied. Equally important, we must learn to use energy more efficiently. Energy consumption is directly related to most air quality problems. The more gasoline and electricity we use, the greater the burden we place on our air.



Missouri's air quality has experienced a steady rate of improvement over the last decade. To continue this positive trend into the next millennium, Missouri will also have to balance the needs of the environment with the needs of industry. The state must examine ways to promote economic growth without compromising air quality, which means improvements will need to be made within existing industry. Missouri and the industrial community will have to work together to clean the air.

Everyone has a stake in keeping Missouri's air clean, and everyone can participate in accomplishing this goal. The next time your favorite powerhouse hitter fills his lungs, let's make sure it's with clean Missouri air.

As a recipient of federal funds, the Missouri Department of Natural Resources does not discriminate on the basis of race, color, religion, national origin, age, sex, or disability. Any person who believes he or she has suffered discrimination may file a complaint with the Department of Natural Resources or with the Office of Equal Opportunity, U.S. Department of the Interior, Washington, D.C., 20240.

1999 Air Quality Highlights

COOPERATIVE DEVELOPMENT OF REGULATIONS

Involving the public in the process of making air quality rules helps to create fair, effective regulations that have broad support. In 1999, DNR continued its commitment to public participation by convening workgroups to help develop air regulations. A workgroup brings industry and the public together with government agencies to share concerns and exchange ideas while developing regulations.

The Construction Permit Streamlining Workgroup continued improving the Construction Permit Regulations and reviewing the internal procedures and policy for the program to review permit applications. After receiving recommendations, the Missouri Air Conservation Commission adopted the proposed amendment to the construction permit rule on July 29, 1999.

The department worked with leaders from industry, environmental organizations and local government to improve air quality in the Kansas City area. In June, DNR participated in the Kansas City Fuels Summit. Discussion focused on determining a motor vehicle fuel strategy to improve air quality in the Kansas City ozone maintenance area, which includes Johnson and Wyandotte counties in Kansas; and Clay, Jackson and Platte counties in Missouri.

FUELS

DNR continues to develop ways for St. Louis and Kansas City to reduce emissions of volatile organic

compounds (VOCs) that contribute to the formation of ground-level ozone (smog). St. Louis is required to reduce VOCs due to its status as an ozone nonattainment area, while the Kansas City reductions are in response to violations of the ozone standard in 1995 and 1997.

In the St. Louis area, recovery of gasoline vapors at fuel pumps is one of the most effective ways to reduce VOC emissions. DNR developed the Missouri Performance Evaluation Test Procedures (MOPETP), a comprehensive set of tests designed to determine the efficiency of gasoline vapor recovery systems and components. In 1999, five manufacturers of gasoline dispensing equipment were either testing or preparing to participate in the MOPETP program. All gasoline dispensing facilities must have a MOPETP approved vapor recovery system installed in order to continue operation after Jan. 1, 2001.

DNR also continued the operating permit program for gas stations in the St. Louis area. The program requires vapor recovery equipment to be tested to assure it is functioning properly. About 980 active stations in the St. Louis ozone nonattainment area are subject to the operating permit rule. The initial permits were completed by Jan. 1, 1999.

Based on the proceedings of the St. Louis Fuel Summit held in 1998 and the governor's formal request to the U.S. Environmental Protection Agency (EPA), federal Reformulated Gasoline (RFG) was required at retail gasoline stations in the St. Louis ozone nonattainment area beginning

June 1, 1999. RFG has a gasoline formula designed to burn cleaner than conventional gasoline. RFG is required all year, not just during the summer. RFG reduces exhaust emissions as well as evaporative emissions and is administered and enforced by the EPA. In 1999, RFG requirements included a minimum 15 percent reduction in both VOC emissions and air toxic emissions compared to conventional gasoline. The requirements also prohibited any increase in Nitrogen Oxide (NOx) emissions. Phase II of the RFG program begins Jan. 1, 2000, and requires additional reductions in VOC and air toxic emissions as well as NOx emission reductions.

In 1999, the use of low Reid vapor pressure (RVP) gasoline was an important component of VOC emission reduction in Kansas City. During summer months, low RVP gasoline evaporates less than conventional gasoline, which reduces emissions of VOCs. Low RVP gas was first required in St. Louis in 1994 and in Kansas City in 1997. Low Reid vapor pressure gasoline was used in Kansas City from June 1 to Sept. 15, 1999.

Following the Kansas City Fuel Summit, on July 28, 1999, the governors of both Missouri and Kansas submitted letters requesting that the EPA require federal Reformulated Gasoline (RFG) for the Kansas City ozone maintenance area. However, a lawsuit was filed against the EPA blocking the use of federal RFG in former nonattainment areas, including Kansas City.

GATEWAY CLEAN AIR PROGRAM

Efforts to bring St. Louis into attainment with the EPA's ozone regulations shifted gears in 1999 with

the launch of the Gateway Clean Air Program (GCAP). The new emissions testing program is an important component in Missouri's ongoing effort to ensure clean air in the St. Louis area. In 1994, high levels of air pollution in St. Louis prompted the Missouri General Assembly to change the vehicle emissions testing program. Beginning in 2000, vehicles in St. Louis City and St. Louis, St. Charles and Jefferson Counties will be using a new enhanced emissions testing program. For the first time, Franklin County will begin using an improved basic idle emissions test.

DNR contracted with Environmental Systems Products Inc. (ESP Missouri), to implement GCAP. ESP Missouri will construct and operate the new vehicle emissions testing facilities and also operate remote sensing monitors. Facility construction began in 1999. These new facilities will begin testing vehicles in April 2000. Motorists will also have the opportunity to have their vehicles tested by remote sensing RapidScreen in early 2000. More information on GCAP is available in the *Controlling St. Louis Ozone* section on page 19.

OZONE TRANSPORT

Because air pollution can spread across geographic boundaries, initiatives involving regional cooperation and study of air quality are becoming more common. In October 1998, the EPA issued a rule that would require Missouri to reduce emissions of NOx, which is a commonly transported air pollutant contributing to ozone formation. In 1998, DNR began development of regulations to comply with the EPA's regional NOx control plan. These regulations would affect utilities, cement kilns and other large industrial activities. The U.S.

Court of Appeals has issued a stay of implementation for these rules.

LITIGATION BLOCKS EIGHT-HOUR STANDARD

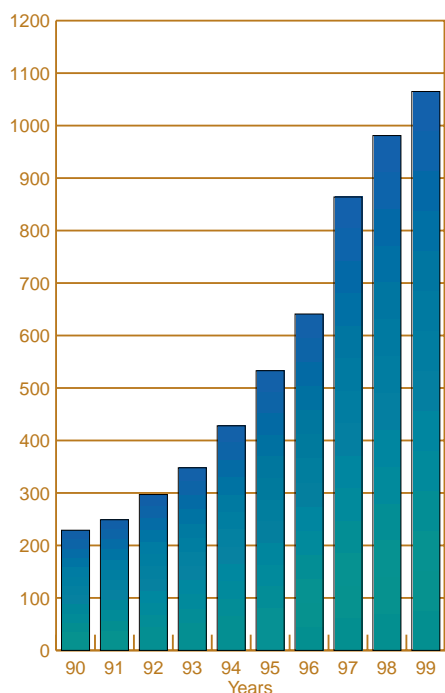
New federal standards adopted in 1997 to reduce ground-level ozone were blocked by litigation in 1999. The new ozone standard, known as the eight-hour standard, would have reduced allowable ozone concentrations from 0.12 parts per million averaged over a one-hour period to a standard of 0.08 parts per million averaged over an eight-hour period. Under this new standard, attainment would have been determined based upon an average of three years of the fourth highest annual daily maximum eight-hour concentration.

In 1997, states began gathering data for the EPA eight-hour standard. The EPA was scheduled to assign area designations in 2000 based on the new eight-hour standard, although the one-hour standard was still to be in effect in areas that had not attained it.

However, in May 1999, a three-judge panel in the District of Columbia Circuit Court determined that the EPA did not have authority to implement this more stringent standard. In October 1999, the U.S. Court of Appeals for the District of Columbia Circuit denied the EPA's request for a rehearing on this decision. The EPA plans to appeal the decision to the U.S. Supreme Court. As 1999 closed, the EPA proposed to reinstate the one-hour ozone standard to ensure that some type of control would remain in place. The eight-hour standard is still being reported so that the EPA can keep the public informed regarding air quality in their area, although the standard can't be implemented until a resolution is reached.



**Construction Permits
Issued by Air Pollution
Control Program 1990-1999**



OPERATING PERMITS

Missouri's Operating Permit Unit remained one of the nation's permit leaders. In 1999, the unit's focus turned to issuing Part 70 (major) permits. The unit issued 102 Part 70 permits, eight Intermediate permits and 82 Basic permits. In 1999, Missouri issued more major source operating permits than any other state in our EPA region. Missouri ranks in the top third of all permitting agencies in the number of permits issued.

CONSTRUCTION PERMITS

Among the 1134 construction permit actions completed in 1999, notable major level permits were issued for Fort Leonard Wood, Empire District Electric in Joplin, the Associated Electric St. Francis Power Plant, and the Utilicorp United Power Plant in Pleasant Hill.

FORT LEONARD WOOD

In October 1999, the APCP issued a Prevention of Significant Deterioration (PSD) permit to Fort Leonard Wood and the U.S. Army Engineer Center in Pulaski County. This permit allows Fort Leonard Wood to include the sources related to the Base Realignment and Closure activities that were not incorporated into the original permit. This permit also provides additional flexibility in training personnel with respect to meteorological conditions, or days of training, and the use of alternative equipment to generate fog.

APCP received the permit application in November 1998. The program completed preliminary review of the project on July 25, 1999. After reviewing comments from the public, the PSD permit was issued on Oct. 1, 1999. The final modeling analysis for

the project showed no exceedances of the PM₁₀ National Ambient Air Quality Standards (NAAQS) particulate matter less than 10 microns in diameter.

The Missouri Coalition for the Environment appealed the new Fort Leonard Wood PSD permit on Oct. 28, 1999. The appeal was referred to the Missouri Air Conservation Commission and the appeal process is proceeding.

ENFORCEMENT ACTIONS AND RESULTS

The Air Pollution Control Program performed 1,544 stationary source inspections in the 1999 calendar year. The program also issued 1,135 Notices of Violation (NOVs) in 1999. Settlements were reached in 146 cases. These settlements resulted in paid penalties of \$261,418 and suspended penalties totaling \$264,315. The department referred 22 cases to the Attorney General's office.

CHARCOAL KILNS

In July 1999, initial tests showed that significant progress has been made in reducing emissions from charcoal kilns. After decades of dense, moist, choking smoke rising up from more than 229 charcoal kilns in Missouri, control devices are being put in place to reduce these emissions.

In March 1998, after months of negotiations between DNR, the EPA and the charcoal industry, the Missouri Air Conservation Commission (MACC) adopted a regulation to phase in controls of charcoal kiln smoke. This regulation requires each charcoal production facility to install afterburners on at least two kilns every year, or remove these kilns from production. The four largest



charcoal companies were required to install more controls on an accelerated schedule.

Royal Oak Enterprises built the first charcoal kiln afterburners and installed them at their plant near Mountain View. The first one was ignited Dec. 7, 1998, and three afterburners were later installed to control 12 kilns. The improvement in air quality was so dramatic that some Mountain View residents thought the plant had shut down because the smoke had disappeared. A test supervised by DNR in July 1999 showed that the afterburners now easily meet the emission limits established by the charcoal rule. The pictures above show the difference between charcoal facilities with these controls and those without.

THE SMALL BUSINESS COMPLIANCE ADVISORY COMMITTEE

Section 507 of the 1990 Clean Air Act Amendments requires states to implement a three-component program to assist small businesses in complying with the air regulations. This is commonly called the small business assistance program. The three components consist of the small

business ombudsman, the technical assistance function to small businesses and the compliance advisory panel. In Missouri, the compliance advisory panel is known as the Small Business Compliance Advisory Committee (SBCAC).

The SBCAC is comprised of seven members: Two are appointed by the governor, one each is appointed by the majority and minority leaders of the House and Senate, and one is appointed by the director of the Department of Natural Resources. The SBCAC has the following responsibilities:

- Receive reports of the small business ombudsman of the governor's office;
- Evaluate the impact of the Air Conservation Law and related rules on small business;
- Review and assess the impact of enforcement policies on small business operations;
- Recommend to DNR, the MACC and the General Assembly changes in procedure, rule or law that would facilitate small business compliance with the Air Conservation Law;
- Recommend to the MACC rules for expedited review of modifications for small business;

- Conduct hearings, determine facts and make investigations consistent with the purposes of the small business technical assistance activity conducted under Section 643.173 (RSMo).

Currently there are four individuals serving on the SBCAC: Bruce Morrison, chairman, St. Louis; Jack Lonsinger, vice-chairman, Excelsior Springs; Joel Braun, Fenton; Caroline Pufalt, St. Louis; and Walter Pearson of DNR. The committee began meeting in 1998 to become familiar with the environmental issues that small businesses face.

The small business technical assistance activity is performed in the Technical Assistance Program (TAP), a non-regulatory service of DNR. TAP's business assistance unit carries out the activities and provides administrative support to the SBCAC. TAP's mission is to provide information, assistance, education and training to business owners, farmers, local governments and the general public on how to control or reduce pollution. For more information, you can contact DNR's Technical Assistance Program at 1-800-361-4827 or (573) 526-6627.



Missouri Air:

A QUARTER CENTURY IN RETROSPECT

Since the creation of the Missouri Department of Natural Resources' Air Pollution Control Program, the state has seen dramatic changes in its air quality. Many of the air pollution problems that once loomed over Missouri's communities are now faded memories. Some of these problems, however, will continue to challenge us into the new millennium. Randy Raymond, chief of the Air Pollution Control Program's Permitting Section, has been with the program since its creation, and recalls some of the high and low points in Missouri's air quality.

AIR QUALITY: A BRIEF HISTORY

While St. Louis and Kansas City continue efforts to reduce ozone levels during hot summer months, overall air quality in these areas has improved dramatically. As recently as the mid-1970s, an area of St. Louis surrounding the I-270 loop exceeded federal standards for carbon monoxide. Another area of south St. Louis was dubbed the "hot spot," exceeding federal standards for not only ozone, but particulate matter and sulfur dioxide as well. Sulfur dioxide emissions came primarily from two industrial sources, and caused many people in the area to experience throat irritation. Some reported a taste in their mouth similar to holding a penny on the tongue. On humid days, these

emissions were so severe that DNR received complaints from women who said their pantyhose were deteriorating from the air pollutants. Kansas City struggled with many of these same problems in the 1970s, being classified as a nonattainment area for both ozone and particulate matter. High levels of airborne lead also plagued many areas of Missouri. Lead production and the use of leaded fuels contributed to the prevalence of this dangerous pollutant.

TAKING THE DIRT OUT OF OUR AIR

Many of the problems experienced by Missouri in the 1970s were addressed by the federal Clean Air Act Amendments of 1977. New standards were established for carbon monoxide, sulfur dioxide, particulate matter, ozone and lead. The APCP began examining methods for bringing these problems under control. The state published rules creating the Prevention of Significant Deterioration permitting process to reduce particulate matter. New sulfur emissions limits were established for power plants. The EPA phased lead out of gasoline, which not only reduced airborne lead exposure, but also allowed the use of catalytic converters. Stage II Vapor Recovery Systems were implemented at gasoline stations in St. Louis to help curb ozone problems. High ozone levels in St. Louis also prompted the

area's first vehicle emissions inspection and maintenance program. Early controls were placed on charcoal kilns, although significant progress wouldn't begin until 1998.

Large changes were also made in enforcement in the last 25 years. Enforcement once consisted only of conference conciliation, persuasion and technical assistance. While the program still relies upon conference conciliation and persuasion whenever possible and continues to provide technical assistance, penalties can now be collected as well. Although penalties were not collected as recently as the mid-1980s, the APCP collected more than \$500,000 in penalties in 1995 and 1998.

ATTRACTING ENVIRONMENTALLY FRIENDLY BUSINESS

Throughout changes in regulations, the APCP has made special efforts to assist businesses wanting to locate in Missouri. Steps have been taken to make sure that these facilities are as clean and efficient as possible. Opening of the General Motors plant in Wentzville required diligent work between industry and program representatives. The Kingsford Charcoal facility in Belle remains one of the company's cleanest facilities in the country. In its production of charcoal, the Kingsford facility uses sawdust that might otherwise go to waste and add to air and water pollution problems. New forms of power have also come to Missouri. The opening of the Callaway Nuclear Power Plant marked a major milestone in the effort to move toward cleaner energy sources. Looking toward the future of electric power, Associated Electric has established twin natural gas-fired turbines in southeast Missouri.

Review of Archer-Daniels-Midland's soybean oil extraction process of North Kansas City, Associated Electric's natural gas-fired combined cycle turbines in southeastern Missouri, and most recently the Kansas City Power and Light's coal-fired power plant in Kansas City, also set the standard for businesses nationally. Important Best Available Control Technology (BACT) analyses resulted from the review of these projects. Issuance of a BACT is the result of a major permitting effort, and is similar to adopting a regulation nationwide. When the state sets a BACT emission limit, new sources that construct anywhere in the nation must operate within that limit or justify why they cannot. Permitting of these facilities in Missouri raised the bar for similar facilities across the country.

TAKE A DEEP BREATH

The state still has much work to do. Charcoal kilns have only recently come under regulation, and St. Louis continues to fight its ozone problem. However, Missouri has cleaned up high levels of carbon monoxide and sulfur dioxide. Kansas City is no longer a nonattainment area for ozone. Significant reductions have been made in airborne lead, although exceedances of the lead standard are still monitored near the lead smelter in Herculaneum. Providing clean air is an important goal for Missouri. Not only does it improve the quality of life for Missouri residents, but it also encourages economic development. It is much easier for a state to attract high-paying, high-technology companies when the quality of the state's environment is the very best available.

Missouri Air Quality History

1970: Congress passes Clean Air Act; authorizes the EPA to establish national air quality standards.

1977: Federal government adopts 1977 Clean Air Act Amendments; areas with serious air quality problems are given more time to comply with standards.

1984: State implements first automobile emissions inspection program in St. Louis.

1989: Stage II Vapor Recovery System adopted for St. Louis; gas nozzles re-designed to catch gasoline vapors.

1990: Federal government adopts 1990 Clean Air Act Amendments, which improve enforcement and permitting programs and take significant steps toward reducing urban smog, acid rain and toxic air emissions.

1992: Kansas City attains federal standard for ozone.

1994: Missouri General Assembly passes bill establishing enhanced automobile emissions inspection program for St. Louis area.

1997: The EPA establishes new health-based standards for ground-level ozone and particulate matter.

1998: Missouri Air Conservation Commission adopts regulation to phase-in control of charcoal kiln emissions.

1999: Missouri Air Conservation Commission adopts amendments to odor regulations for Class 1A Concentrated Animal Feeding Operations. Federal RFG is introduced in St. Louis.

OTHER AIR POLLUTANTS

In addition to the six criteria pollutants, DNR's APCP also regulates other pollutants, including asbestos and hazardous air pollutants.

ASBESTOS:

Asbestos is a naturally occurring mineral that takes the form of hollow microscopic fibers. Before it was recognized as a carcinogen, asbestos was widely used for insulation and fireproofing. With age, it breaks down and becomes a hazard to anyone who breathes its airborne fibers. Federal and state laws regulate the removal of asbestos from buildings and DNR monitors these activities.

HAZARDOUS AIR POLLUTANTS (HAPS):

Some air pollutants can cause quick and painful death, cancer, reproductive disorders and environmental damage such as acid rain. The EPA has designated these pollutants as hazardous air pollutants, which may present a hazard to public health and safety if released in sufficient quantity.

Major Air Pollutants

The benchmarks for clean air in Missouri are the National Ambient (outdoor) Air Quality Standards (NAAQS) established by the EPA under the Clean Air Act. The standards address six "criteria pollutants" considered harmful to public health and the environment: ozone, lead, inhalable particles, carbon monoxide, nitrogen dioxide and sulfur dioxide. These standards are found on page 11.

OZONE (URBAN SMOG): Ground-level ozone is a colorless gas, the most harmful part of what we commonly know as "smog." Ozone is not directly emitted. It forms on sunny hot summer days when sunlight causes a reaction between volatile organic compounds (VOCs) and nitrogen oxides (NOx). Vehicles, power plants and industrial boilers are common sources of nitrogen oxides. Gasoline powered vehicles are a major source of VOCs.

"Good up high - bad nearby"

There are two types of ozone: stratospheric (upper atmosphere) and ground-level ozone. Ozone in the stratosphere occurs naturally and is desirable, shielding the earth from ultraviolet rays. But ozone at ground level is a powerful respiratory irritant.

AIRBORNE LEAD: In Missouri, airborne lead and its compounds are produced mainly by lead smelters. Children under six are the most endangered by airborne lead, so the standard has been established to protect their health. In 1985, 73 percent of airborne lead came from vehicle exhaust pipes. This dropped to 34 percent by 1988 due to federal

controls on gasoline that started in the mid-1970s.

INHALABLE PARTICLES: Inhalable particles include airborne dust, pollen, soot and aerosol sprays. Scientists also sometimes refer to these as "particulate matter." Current federal standards apply to particles less than 10 microns in diameter, or PM₁₀, emitted mainly by vehicles, industry and farms. Wind and rainfall cause seasonal variations in PM₁₀. In 1997, the EPA set new standards for even finer particles less than 2.5 microns in diameter, or PM_{2.5} (see page 9).

CARBON MONOXIDE: Carbon monoxide (CO), formed by the incomplete combustion of fuel, is a most common pollutant. More than 75 percent of CO emissions come from vehicle exhaust and the highest concentrations are caused by congestion in metropolitan areas. Though deadly, CO is transformed rapidly into carbon dioxide.

NITROGEN DIOXIDE: Almost all nitrogen dioxide is man-made. If fuel is burned above 1200 degrees Fahrenheit, airborne nitrogen forms highly reactive nitrogen oxides such as nitrogen dioxide. Principal sources are power plants, industrial boilers and vehicles.

SULFUR DIOXIDE: Sulfur oxides are produced by burning sulfur-containing fuels such as coal and oil, by smelting metals and by other industrial processes. Sulfur dioxide (SO₂) composes about 95 percent of these gases.

Health Effects of Air Pollution

| <i>Pollutant</i> | <i>Health Effects</i> |
|--|--|
| OZONE: A colorless gas, the most harmful part of what we commonly call "smog." | Throat irritation, congestion, chest pains, nausea and labored breathing. Aggravation of existing lung or heart conditions, allergies and asthma. Ozone is especially harmful to those who work or play outside. Ozone is also harmful to plant life, damaging forests and reducing crop yields. |
| LEAD: Compounds of lead emitted as particles or fumes. | Low doses damage the central nervous system of fetuses and children, causing seizures, mental retardation and behavioral disorders. In children and adults lead causes fatigue, disturbed sleep, decreased fitness, and damage to kidneys, liver and blood-forming organs. High levels damage the nervous system and cause seizures, coma and death. |
| INHALABLE PARTICLES (PM₁₀): A broad class of particles 10 micrometers or smaller in diameter, that may include airborne soot, dust, pollen and aerosol sprays. | Increased likelihood of chronic or acute respiratory illness. Difficulty breathing, aggravation of existing respiratory or cardiovascular illness and lung damage. |
| INHALABLE PARTICLES (PM_{2.5}): Includes a broad class of particles 2.5 micrometers or smaller in diameter, such as metals, elemental carbon, condensed aerosols, nitrates and sulfates, as well as other compounds specific to certain areas of the country. | Results in respiratory problems such as hoarseness, sore throat, wheeze, chest pain, loss of lung flexibility and reduction of lung function. Increased potential for the development of chronic lung disease. This damage to the lungs can lead to episodic short-term illnesses, increasing the number of school absences, lost work days, hospital admissions and respiratory-related deaths. |
| CARBON MONOXIDE: An odorless, colorless, tasteless, poisonous gas. | Impaired vision and manual dexterity, weakness and mental dullness. At high levels: vomiting, fast pulse and breathing, followed by slow pulse and breathing, then collapse and unconsciousness. |
| NITROGEN DIOXIDE: A poisonous, reddish-brown to dark brown gas with an irritating odor. | Lung inflammation and lower resistance to infections like bronchitis and pneumonia. Suspected of causing acute respiratory diseases in children. |
| SULFUR DIOXIDE: A colorless gas with a strong suffocating odor. | Irritation of throat and lungs with difficulty in breathing. Aggravation of existing respiratory or cardiovascular illness. |
| HAZARDOUS AIR POLLUTANTS: Numerous chemicals classified by their hazardous health effects. | May cause cancer, reproductive disorders and death. |
| ASBESTOS: Densely packed microscopic fibers, once used for insulation and fireproofing. | Lung cancer, asbestosis (a progressive irreversible scarring of the lungs) and mesothelioma (cancer of the chest cavity's lining). |

Clean Air Standards

The Clean Air Act established two types of national air quality standards. Primary standards were established to protect public health, including the health of “sensitive” populations such as children, elderly and those with respiratory illnesses. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation and buildings.

NEW STANDARDS

In 1997, the EPA established new health-based standards for ground-level ozone and particulate matter. The standards were established after extensive scientific reviews showed that the changes were necessary to protect public health and the environment. However, the new ozone standards were challenged in court. In May 1999, the U.S. Court of Appeals for the District of Columbia Circuit declared that the new ozone standards were not enforceable.

FINE PARTICULATE MATTER

In revising the air quality standards, the EPA created new standards for PM_{2.5} (fine particulate matter less than

2.5 microns in diameter). The EPA's scientific review concluded that fine particles, which penetrate deeply into the lungs, are more damaging to human health than the coarse particles known as PM₁₀. The EPA also modified the 24-hour PM₁₀ (fine particulate matter less than 10 microns in diameter) standard to be based on a three-year average of the 99th percentile of data. These standards are listed in the table on page 11.

AIR QUALITY MONITORS IN MISSOURI

In 1999, the Missouri Air Pollution Monitoring Network included 111 monitors of three types: national monitors, state and local agency monitors and special-purpose monitors. National monitors provide data on national trends. State and local agencies operate other permanent monitors. Special-purpose monitors are placed for a limited time to study small areas or special sites. The monitors are placed to gather representative data as well as worst-case occurrences. There are also 44 meteorological monitors in operation throughout the state. The data collected at these monitors are used for analysis and modeling purposes.



National Ambient Air Quality Standards

| Criteria Air Pollutant | Averaging Time | Primary Standard | Secondary Standard |
|---|---|---|--|
| Carbon Monoxide | Eight-hour maximum ^a | 9 ppm ^d (10 mg/m ³) ^c | None |
| | One-hour maximum ^b | 35 ppm ^d (40 mg/m ³) ^c | None |
| Lead | Maximum Quarterly Arithmetic Mean | 1.5 mg/m ³ ^c | Same As Primary Standard |
| Nitrogen Dioxide | Annual Arithmetic Mean | 0.05 ppm ^d (100 mg/m ³) ^c | Same As Primary Standard |
| Ozone | One-hour average ^b | 0.12 ppm ^d (235 mg/m ³) ^c | Same As Primary Standard |
| Particulate Matter (PM ₁₀) | Annual Arithmetic Mean 24-hour average ^f | 50 mg/m ³ ^c 150 mg/m ³ ^c | Same As Primary Standard |
| Particulate Matter (PM _{2.5}) | Annual Arithmetic Mean ^g 24-hour average ^h | 15 mg/m ³ ^c 65 mg/m ³ ^c | Same As Primary Standard |
| Sulfur Dioxide | Annual Arithmetic Mean | 0.03 ppm ^d (80 mg/m ³) ^c | 0.5 ppm ^d (1300 mg/m ³) ^c |
| | 24-hour maximum ^a | 0.14 ppm ^d (365 mg/m ³) ^c | |
| | Three-hour maximum ^b | | |

^a Not to be exceeded more than once a year for primary and secondary standards.

^b Not to be exceeded more than once a year for primary and secondary standards.

^c mg/m³ = milligrams per cubic meter.

^d ppm = part per million.

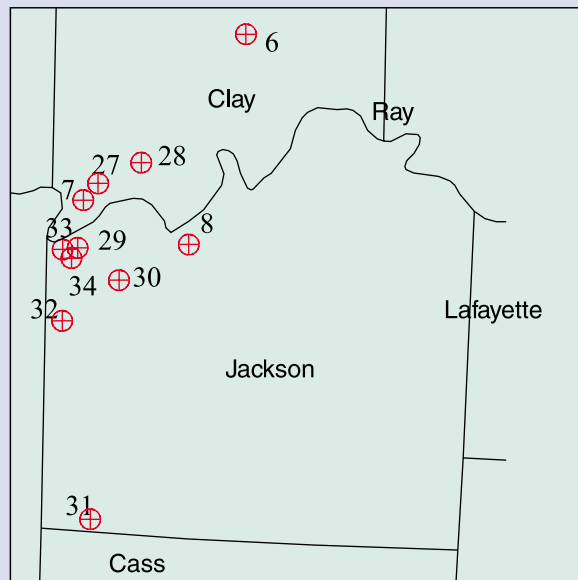
^e g/m³ = micrograms per cubic meter.

^f Established for a three-year average of the 99th percentile of data.

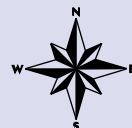
^g Established for a three-year average.

^h Established for a three-year average of the 98th percentile of data.

| SITE | SITE NAME |
|------|---------------------------------|
| 01 | South 759 Hwy St Joseph |
| 02 | St. Joseph Levee |
| 03 | 12th and Mitchell St Joseph |
| 04 | El Dorado Springs |
| 05 | Watkins Mill State Park |
| 06 | Hwy 33 & County Home Liberty |
| 07 | North Kansas City |
| 08 | Sugar Creek |
| 09 | Schuyllkill Metals West |
| 10 | Mountain View |
| 11 | Hogan |
| 12 | Dunn |
| 13 | Tindell |
| 14 | Hogan Mountain |
| 15 | Carthage Stone |
| 16 | Dunklin High School Herculeanum |
| 17 | Arnold Tenbrook & Tenbrook |
| 18 | Herculeanum |
| 19 | Festus |
| 20 | Lincoln South |
| 21 | Lincoln North |
| 22 | Mark Twain State Park |
| 23 | Hwy 94 West Alton |
| 24 | Orchard Farm |
| 25 | Bonne Terre |
| 26 | Ste Genevieve |



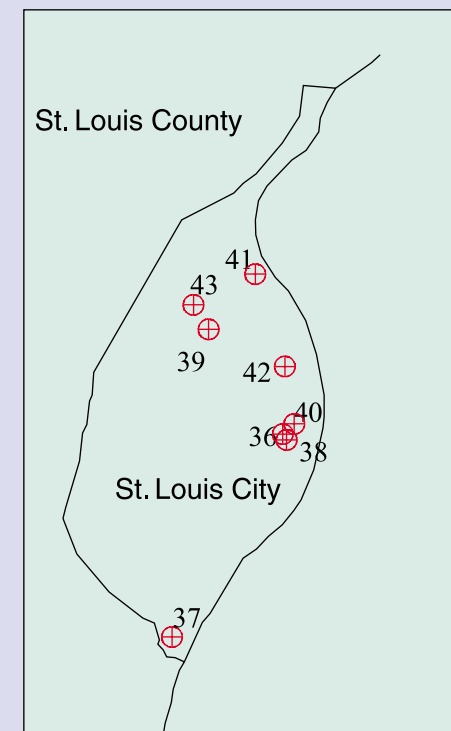
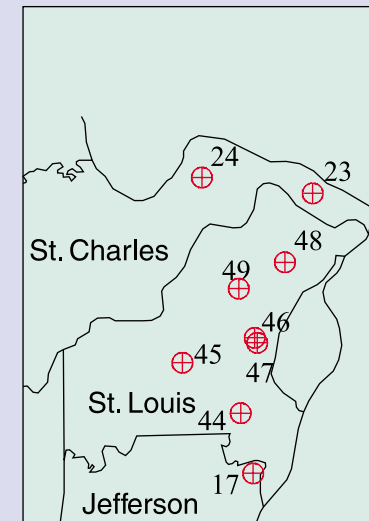
| SITE | SITE NAME |
|------|------------------------|
| 27 | 2600 NE Parvin Rd |
| 28 | 49th & Winchester WOF |
| 29 | 724 Troost |
| 30 | 27th & Van Brunt |
| 31 | Richards Gebaur AFB |
| 32 | 4928 Main Street |
| 33 | 800 Broadway |
| 34 | 1517 Locust |
| 35 | 11500 North 71 Hwy KCI |



| SITE | SITE NAME |
|------|--------------------|
| 50 | 5012 S Charleston |
| 51 | Southwest MO State |
| 52 | Hillcrest School |
| 53 | James River South |

| SITE | SITE NAME |
|------|----------------------------|
| 44 | 4580 S Lindbergh Affton |
| 45 | 305 Weidman Rd Queeny Park |
| 46 | 77 Hunter Ave Clayton |
| 47 | 55 Hunter Ave Clayton |
| 48 | 3400 Pershall Rd |
| 49 | 10267 St Charles Rock Rd |

| SITE | SITE NAME |
|------|---------------------------|
| 36 | 14th & Market |
| 37 | 8227 S Broadway & Hurck |
| 38 | 1122 Clark & Tucker |
| 39 | Newstead & Cote Brilliant |
| 40 | 10th & Washington |
| 41 | Hall Street & Carrie |
| 42 | Blair Street |
| 43 | Margaretta |

Missouri Department
of Natural Resources

Air Pollution Control Program

Missouri's Air Quality

Two exceptions to good air quality in Missouri are the St. Louis area during the summer and one spot in east Missouri. The St. Louis area has repeatedly exceeded the ozone standard and is designated by the EPA as a moderate-level nonattainment area for ozone. This area includes the city of St. Louis and Franklin, Jefferson, St. Charles and St. Louis counties (see page 17), as well as Madison, Monroe and St. Clair counties in Illinois. A small area near a lead smelter in Jefferson County still exceeds federal standards for airborne lead (see page 22).

AIR QUALITY TRENDS

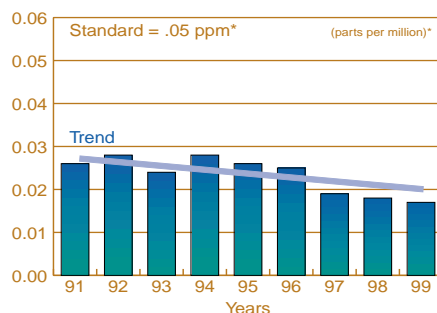
The department monitors air concentrations of the six criteria pollutants at selected locations throughout the state. Missouri is monitoring attainment of the air quality standards in most areas.

The graphs below are representative of general trends of ambient air data from four pollutants including CO, NO₂, SO₂ and PM₁₀. The overall trend as shown by the four graphs is improved air quality.

AIR QUALITY TRENDS AT SELECTED LOCATIONS

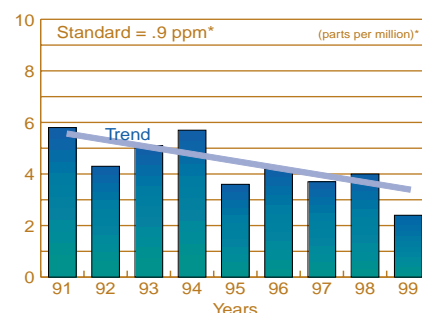
NITROGEN DIOXIDE ANNUAL MEAN, ppm

South Lindbergh, Affton 1991-99



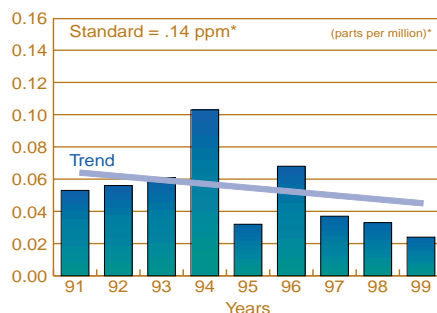
CARBON MONOXIDE 2nd 8-hr MAX, ppm

St. Charles Rock Road, St. Ann 1991-99



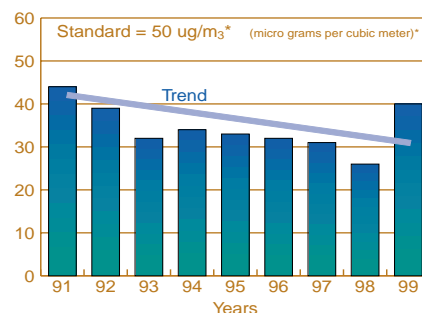
SULFUR DIOXIDE 2nd 24-hr MAX, ppm

South Charleston, Springfield 1991-99



PM10 ANNUAL MEAN, ppm

St. Joseph, Missouri 1991-99



EMISSION TRENDS

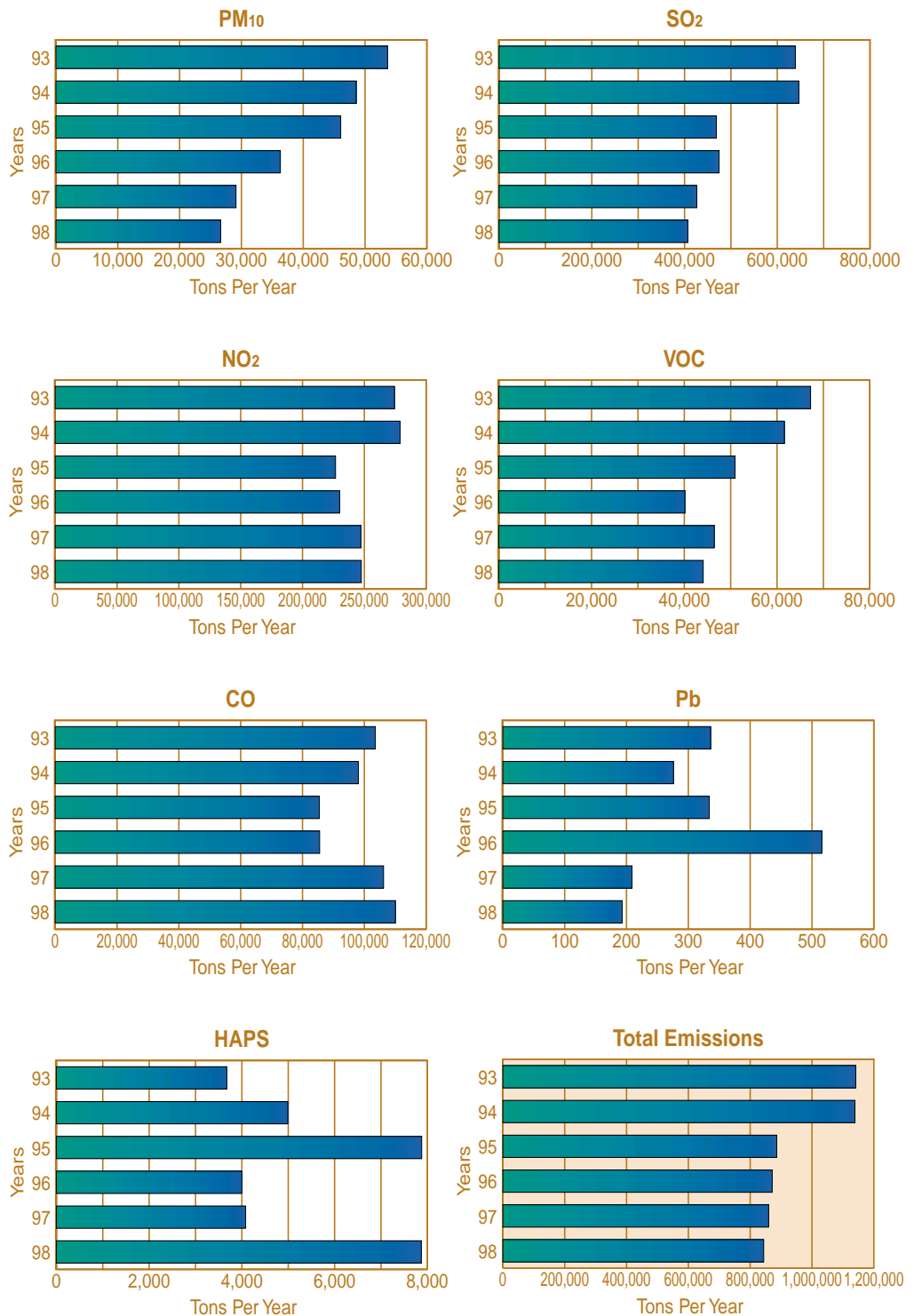
The graphs at right show the total emissions of the criteria and hazardous air pollutants (HAPs) that Missouri facilities reported for the years 1994 to 1998. As shown in Table 1, Missouri facilities continued to reduce emissions of certain pollutants into the air.

Facilities have generally reported decreased emissions of PM₁₀, SO₂, NO₂ and HAPs. The reduction in sulfur dioxide emissions was particularly significant, with a 51 percent decline since 1992. This may be due to the use of low-sulfur coal and conversion to cleaner-burning natural gas. New emission factors affecting the lead mining industry have resulted in a lead reduction of 44 percent. Industries have also reported a 12 percent decline in the emission of NO₂.

Since 1993, facilities have seen PM₁₀ emissions reduced by 50 percent, while VOC emissions have dropped by 35 percent. Although the 1998 HAPs emissions being reported have increased by 48 percent from the previous year, this is primarily due to the fact that companies are now including HAPs in their responses to Emissions Inventory Questionnaires. Emissions of CO have remained about the same.

Records show an increase in the number of emission sources from approximately 1,800 in 1992 to more than 2,500 in 1998. Although economic development probably played a role, this is also partially a result of new standards affecting additional sources.

ANNUAL REPORTED EMISSIONS



Ozone in Missouri

Naturally occurring ozone in the upper atmosphere protects the earth from the sun's harmful rays. But ground-level ozone is an irritant that damages lung tissue and aggravates respiratory disease. Ground-level ozone is formed when heat and sunlight mix with volatile organic compounds (VOC) and nitrogen oxide emissions in the lower atmosphere. People show various respiratory symptoms upon exposure to ozone. New data indicate that even healthy young adults may experience respiratory problems at ozone levels as low as .08 parts-per-million (ppm) if they remain outdoors for extended periods. This could include individuals whose jobs require a great deal of time outdoors, such as road construction workers, or even individuals working in their lawns or gardens. However, persons most susceptible to ozone include children,

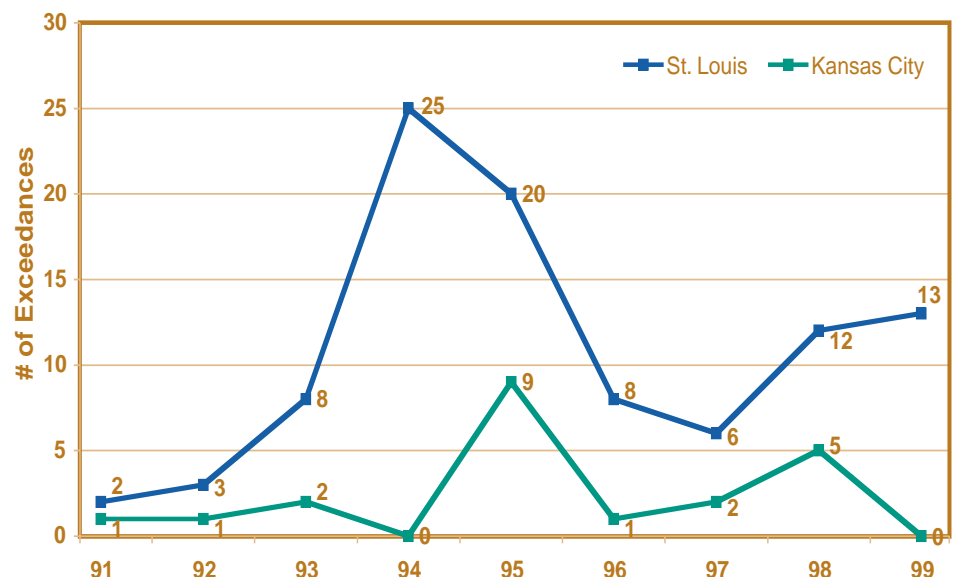
the elderly and individuals with pre-existing respiratory problems.

NUMBER OF OZONE SITE EXCEEDANCES REPORTED

Approximately 4 million of Missouri's 5.4 million residents live in St. Louis and Kansas City where the likelihood of ozone formation is greatest. The National Ambient Air Quality Standard of .12 ppm is often exceeded on hot, sunny summer days. The number of days the standard is exceeded in a given year generally reflects both weather conditions and the pollutants in the area's air.

In 1999, the St. Louis ozone nonattainment area reported 13 exceedances of the one-hour ozone standard. For the first time in several years, however, no exceedances were reported in Kansas City.

Ozone Site Exceedances

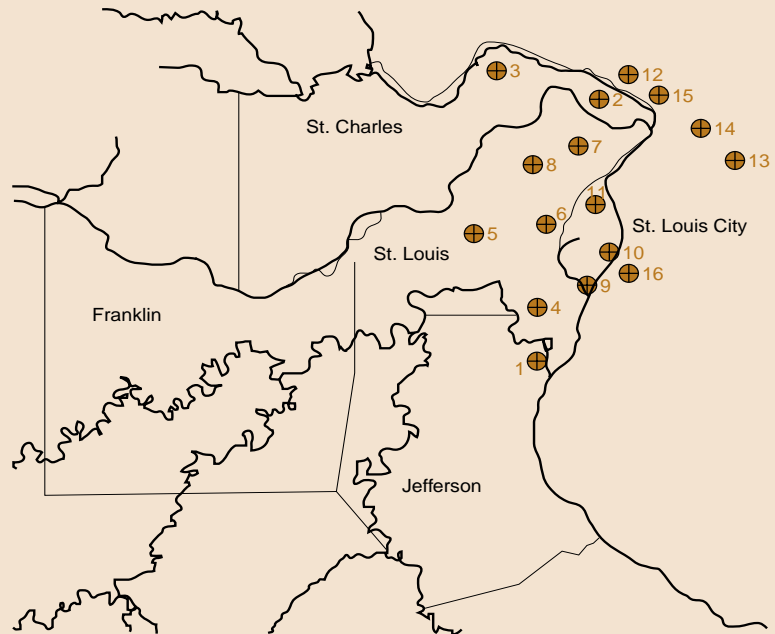


OZONE IN ST. LOUIS

Under the Clean Air Act, the EPA has designated many areas in the country as nonattainment for at least one criteria pollutant. Areas not in compliance with the ozone standard are classified marginal, moderate, serious, severe or extreme in their levels of nonattainment. The St. Louis ozone nonattainment area is one of six areas nationwide currently classified as a "moderate" nonattainment area.

The St. Louis moderate nonattainment area includes the city of St. Louis and the counties of St. Charles, St. Louis, Jefferson and Franklin. The Illinois side includes Madison, Monroe and St. Clair counties. The map on the right shows the sites for air monitors in the nonattainment area. The chart below shows the number of days health-based ozone standards were actually exceeded, in comparison to the number of days weather conditions were favorable to ozone exceedances.

St. Louis Ozone Nonattainment Area Monitoring Sites



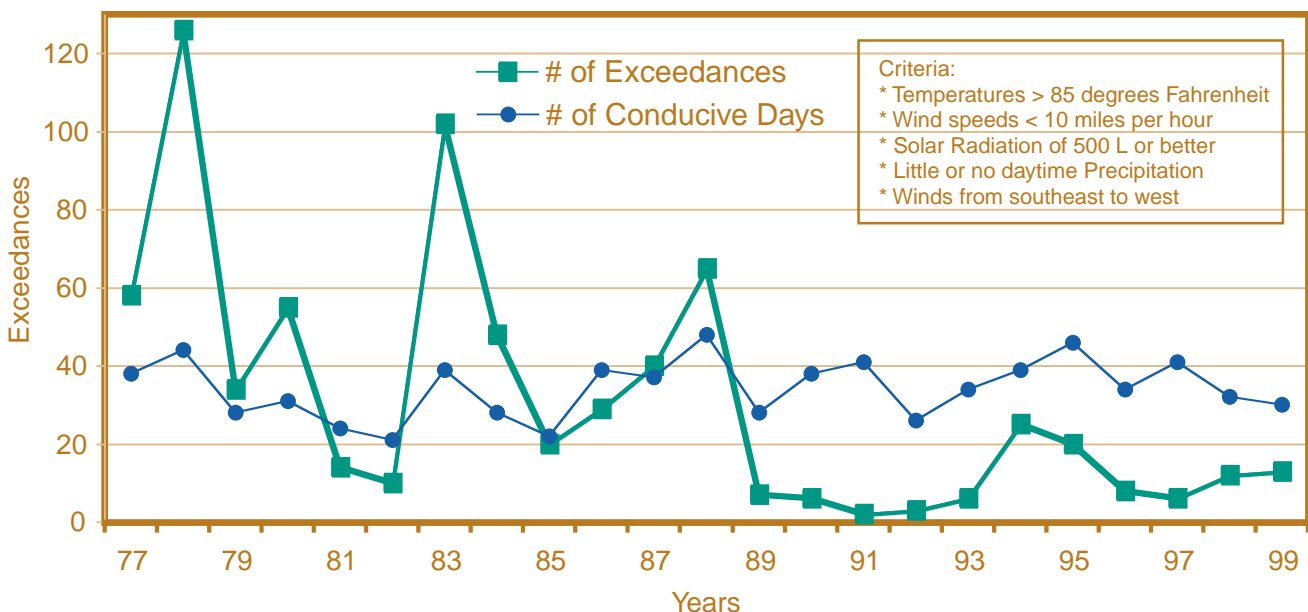
Site Number Site Name

| Missouri | |
|----------|---------------------------------------|
| 01 | Arnold Tenbrook, Arnold |
| 02 | West Alton |
| 03 | Orchard Farm |
| 04 | 4580 S. Lindbergh and Gravois, Affton |
| 05 | 305 Weidman Rd., Queeny Park |
| 06 | 55 Hunter Ave., Clayton |
| 07 | 3400 Pershall Rd., Ferguson |
| 08 | 10267 St. Charles, St. Ann |
| 09 | 8227 S. Broadway, St. Louis |
| 10 | 1122 Clark, St. Louis |
| 11 | Newstead and Cote Brillante |

Site Number Site Name

| Illinois | |
|----------|------------------------------|
| 12 | 409 Main St., Alton |
| 13 | 200 W. Division, Maryville |
| 14 | Poag Road, Edwardsville |
| 15 | 54 N. Walcott, Wood River |
| 16 | 13th and Tudor, E. St. Louis |

St. Louis Nonattainment Area 1-Hour Ozone 1977 - 1999 # of Exceedances vs Conducive Days



Criteria:

- * Temperatures > 85 degrees Fahrenheit
- * Wind speeds < 10 miles per hour
- * Solar Radiation of 500 L or better
- * Little or no daytime Precipitation
- * Winds from southeast to west

NUMBER OF DAYS WITH EXCESSIVE OZONE

St. Louis exceeded the ozone standard each summer between 1996 and 1999. The table below shows the number of days that sites in Missouri and Illinois reported exceeding the ozone standard. The St. Louis ozone nonattainment area reported 13 exceedances of the one-hour standard during the 1999 ozone season (April 1 through October 31). Missouri had 11 exceedances; Illinois had two.

Number of Days with Excessive Ozone - St. Louis Nonattainment Area

| # of 1-Hour Exceedances | | | | | | | | | | | | |
|--------------------------------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Site | Address | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| St. Louis | Missouri | | | | | | | | | | | |
| Arnold | Arnold and Tenbrook | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 1 |
| West Alton | Highway 94 | 2 | 2 | 0 | 0 | 0 | 4 | 4 | 1 | 1 | 2 | 3 |
| Orchard Farm | | | | | | | | 2 | 1 | 0 | 1 | 2 |
| St. Louis | 8227 S. Broadway | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| St. Louis | 1122 Clark and Tucker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| St. Louis | Newstead & Cote Brillante | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Affton | S. Lindbergh | 0 | 1 | 1 | 2 | 2 | 2 | 0 | 1 | 1 | 1 | 0 |
| Queeney Park | 305 Weidman | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 1 |
| Clayton | 55 Hunter Avenue | 1 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 1 |
| Ferguson | 3400 Pershall Road | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 1 |
| St. Ann | 10267 St. Charles Rock Road | 1 | 1 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 1 | 1 |
| | Illinois | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| Alton | 409 Main Street | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 2 | 0 | 0 | 1 |
| Maryville | 200 West Division | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Edwardsville | Poag Road | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 |
| Wood River | 54 North Walcott | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 1 |
| East St. Louis | 13th and Tudor | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| St. Louis Nonattainment Total | | 7 | 6 | 2 | 3 | 6 | 25 | 20 | 8 | 6 | 12 | 13 |

CONTROLLING ST. LOUIS OZONE

Missouri's State Implementation Plan (SIP) for St. Louis includes control measures and schedules for compliance with the Clean Air Act in order to attain the ozone standard. To reduce ambient ozone concentrations to safe levels, the state must control industrial and mobile sources of volatile organic compounds (VOCs). Major control measures in St. Louis include a vehicle emissions inspection and maintenance program, Stage II vapor recovery systems for gasoline refueling, emission control systems for existing and new industrial sources and some contingency measures in case the mandatory controls fail to attain the standard. Two control strategies leading to the greatest reductions in volatile organic compound emissions are enhanced vehicle inspection and maintenance and the use of reformulated gasoline.

VEHICLE EMISSIONS INSPECTIONS

The program for vehicle emissions testing and repair, or Inspection and Maintenance (I/M), is a key mechanism for controlling mobile source emissions in the St. Louis area. This program represents a large portion of DNR's state implementation plan to bring St. Louis into compliance with the National Ambient Air Quality Standards (NAAQS) for ozone, or urban smog.

During 1999, the state continued testing vehicles using the existing basic emissions program that was part of the annual safety inspection conducted at local car service facilities every year. This year, the state also made significant progress toward the start of an enhanced I/M program.

In February 1999, DNR signed a contract with Environmental Systems Products Inc. (ESP Missouri) to implement a new enhanced I/M

program in the St. Louis nonattainment area. The new program, called the Gateway Clean Air Program (GCAP), was formally launched in 1999 with the announcement of the testing site locations and is to begin in April 2000.

GCAP will incorporate two new emissions testing technologies. The enhanced test simulates real driving conditions on a chassis dynamometer (treadmill-like device) during testing and measures specific pollutants from vehicles much more precisely than the current system. Stations performing this test cannot offer repair services. The second test, called RapidScreen, uses a remote sensing device to monitor exhaust emissions while vehicles are being driven on roads and highways. RapidScreen will allow the very cleanest-running vehicles to pass the new emissions test without visiting emissions testing stations.

Under contract, ESP Missouri will build and operate a network of 12 emissions testing stations in the St. Louis area. The sites form a network throughout the St. Louis nonattainment area to maximize convenient access for motorists. In 1999, the contractor began construction of testing stations and started to collect preliminary emissions data with remote sensing technology as a basis for on-road RapidScreen of vehicles in early 2000.

LOW REID VAPOR PRESSURE GASOLINE AND REFORMULATED GASOLINE

Many Volatile Organic Compound (VOC) control measures have been used in the effort to reach attainment of the ozone standard. In 1994, low vapor pressure gasoline was implemented in St. Louis. Reid vapor pressure (RVP) is a measure of the volatility of gasoline or its tendency to evaporate into the air. Lowering RVP reduces evaporative emissions of gasoline. Between 1994 and 1998, a state regulation restricted the RVP of gasoline sold in the St. Louis nonattainment area during the warmest months of the year, June 1 through Sept. 15.

At the request of the Governor, federal Reformulated Gasoline (RFG) was required at the retail level for the Missouri portion of the St. Louis nonattainment area as of June 1, 1999. RFG has a special gasoline formula designed to burn cleaner than conventional gasoline, and to reduce both exhaust and evaporative emissions. RFG is administered and enforced by the EPA.

AREA RECLASSIFICATION ("BUMP-UP")

Moderate nonattainment areas were required to meet the NAAQS for ozone by Nov. 15, 1996. Because St. Louis failed to meet this goal, the area may be reclassified by the EPA, or "bumped up" in its nonattainment status from moderate to serious. In 1998, the EPA proposed a new policy that may allow St. Louis to obtain an attainment date extension. The department committed to meeting the requirements of the EPA's policy. Under the policy, DNR must demonstrate that St. Louis is affected by transported air pollution from upwind areas. Also, all required local control measures must be implemented and DNR must submit an EPA-approvable Attainment Demonstration showing the area will attain the ozone standard.

On Nov. 12, 1999, DNR submitted a package of regulatory requirements to the EPA including the Vehicle Inspection and Maintenance Plan, the Fifteen Percent Rate-of-Progress Plan, the Attainment Demonstration, seven reasonably available control technology (RACT) rules and a draft regulation to reduce statewide emissions of nitrogen oxides. DNR expects the EPA to grant an attainment date extension based on the information submitted. One obstacle to the attainment date extension is a lawsuit filed in July 1998 by environmental groups against the EPA for failure to bump up the St. Louis area. Should this bump up occur, St. Louis would be obligated to meet the more stringent requirements of the Clean Air Act Amendments of 1990 for serious nonattainment areas.

OZONE IN KANSAS CITY

The Kansas City Ozone Maintenance Area includes Clay, Jackson and Platte counties in Missouri as well as Johnson and Wyandotte counties in Kansas. The Kansas City area was designated as a sub-marginal nonattainment area under the Clean Air Act Amendments of 1990. In 1992, the Kansas City area demonstrated compliance with the standard and was redesignated to attainment.

In 1999, Kansas City did not report any exceedances of the one-hour ozone standard. During the 1998 ozone season, the Kansas City area reported five exceedances. Four of the exceedances occurred in Missouri. One exceedance occurred in Kansas. The table below shows the number of days each site reported exceeding the ozone standard between 1989 and 1999.

Number of Days with Excessive Ozone - Kansas City Ozone Maintenance Area

of 1-Hour Exceedances

| Site | Address | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
|--------------------|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Kansas City | | | | | | | | | | | | |
| | Missouri | | | | | | | | | | | |
| Liberty | Hwy 33 and County Hwy | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 1 | 2 | 0 |
| Lawson | Watkins Mill State Park Road | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| Kansas City | 49th and Winchester WOF | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Kansas City | Richards Gebaur AFB | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kansas City | 11500 N. 71 Hwy KCI Airport | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| | Kansas | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| Wyandotte CO | Ann Avenue | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| Total | | 1 | 2 | 1 | 1 | 2 | 0 | 9 | 1 | 2 | 5 | 0 |

CONTROLLING KANSAS CITY OZONE

The Kansas City area has experienced ozone problems since the late 1970s. In response to the Clean Air Act Amendments of 1990, DNR promulgated two regulations that reduced the Reid vapor pressure (RVP) of gasoline in the Kansas City area. RVP is a measure of the tendency of gasoline to evaporate into the air. Lowering gasoline's RVP reduces its evaporative emissions. From 1990 through 1997, the RVP of gasoline in Kansas City has been reduced on three occasions. The latest change occurred during the summer of 1997. DNR and the Kansas Department of Health and

Environment both required that 7.2 RVP gasoline be sold in the Kansas City Maintenance Area during the peak ozone season, June 1 through September 15.

DNR's Air Pollution Control Program developed an ozone control strategy after working with the Mid-America Regional Council (MARC), the Kansas Department of Health and Environment, Kansas City local agencies, environmental groups and industrial representatives. This strategy was to be implemented in place of the contingency measures included in the 1992 Kansas City Ozone Maintenance State Implementation Plan. After extensive evaluation of control options, DNR, the EPA, the Kansas Department of Health and Environment, MARC and other community representatives

selected a control strategy including federal RFG. The Missouri Air Conservation Commission (MACC) adopted the Maintenance Plan in February 1998.

RFG would have replaced low RVP gasoline as the fuel control strategy. DNR and the Kansas Department of Health and Environment hosted a Fuels Summit in June 1999. This summit resulted in a recommendation to proceed with RFG. The governors of Kansas and Missouri requested that the EPA include the Kansas City area in the federal RFG program at the end of July 1999. However, a lawsuit brought by the American Petroleum Institute against U.S. EPA has blocked the use of federal RFG in former ozone nonattainment areas, including Kansas City.



Lead In Missouri

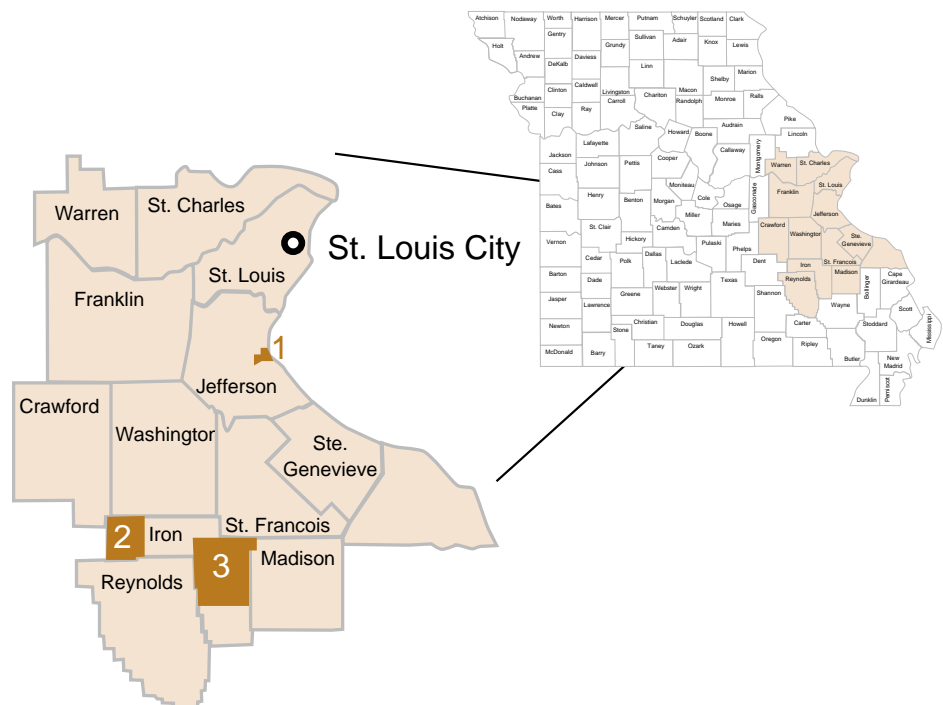
LEAD NONATTAINMENT AREAS

Lead compounds can cause damage to the brain and nervous system. One site in southeast Missouri still exceeds federal health standards for airborne lead. A smelting facility is located at this site. The federal Clean Air Act Amendments of 1990 require states to bring all nonattainment sites into compliance with the lead standard. With the cooperation of the Doe Run Company, control strategies were developed for sites in Herculaneum, Buick and Glover, MO. The strategies used in Buick and Glover were successful in reducing airborne lead emissions. They are currently still classified as

nonattainment areas, although neither area has registered an exceedance in the last eight quarters.

Although air quality in the Herculaneum area has improved in recent years, the area continues to show violations of the lead standard. To solve this problem, the EPA has recommended an additional modeling tool be used to better understand the cause of these violations. This tool, known as Chemical Mass Balance Modeling, allows users to determine individual source contributions by examining the chemical profile, or fingerprint, of each source, and comparing this to samples collected in the ambient air.

Lead Nonattainment Areas



Nonattainment Area

- 1 City of Herculaneum.....
- 2 Dent Township.....
- 3 Liberty/Arcadia Township.....

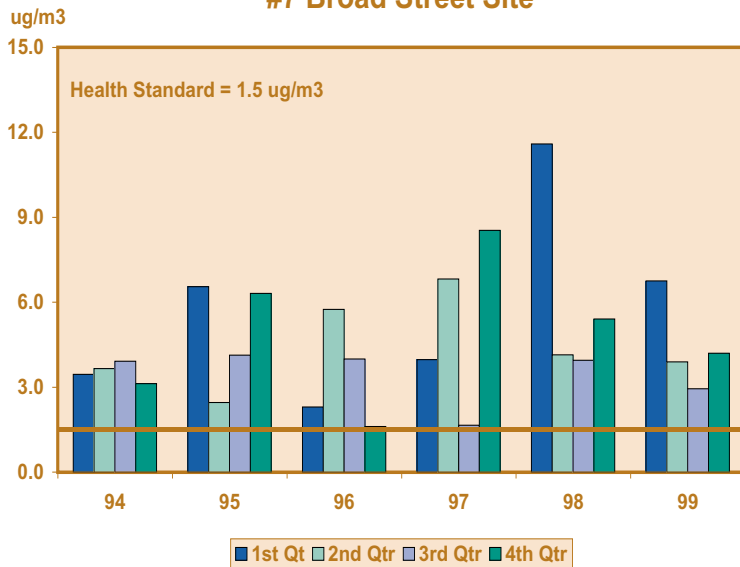
Primary Lead Emitter

- Doe Run, Herculaneum
- Doe Run, Buick
- Doe Run, Glover

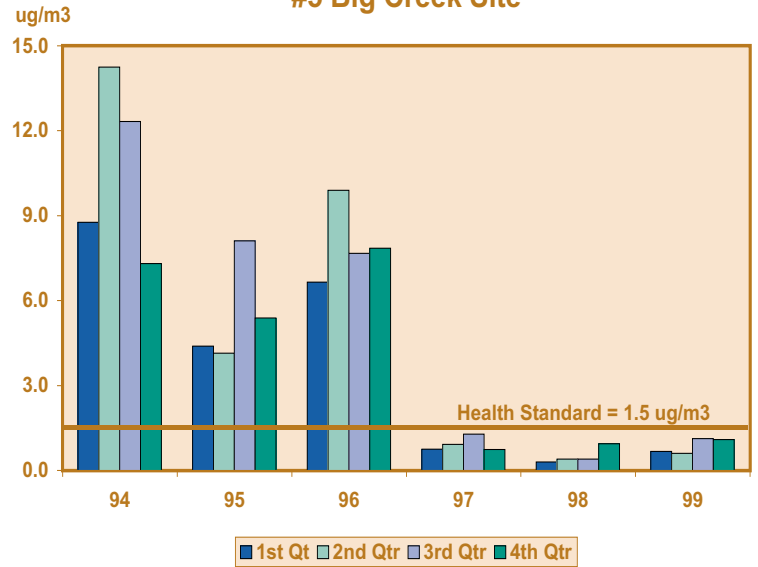
AVERAGE QUARTERLY CONCENTRATIONS OF LEAD IN AMBIENT AIR NEAR LEAD SMELTERS IN MISSOURI

Since Missouri is the chief lead-mining district in the nation, with several smelters, the department conducts ambient monitoring for lead. Developed by the EPA, the health standard for lead defines the maximum safe level for human exposure to this otherwise useful metal. The National Ambient Air Quality Standard for lead is 1.5 micrograms per cubic meter, averaged from all the monitor filters in one-quarter of the year. Currently, the Herculanum smelter is the only one registering exceedances of the airborne lead standard.

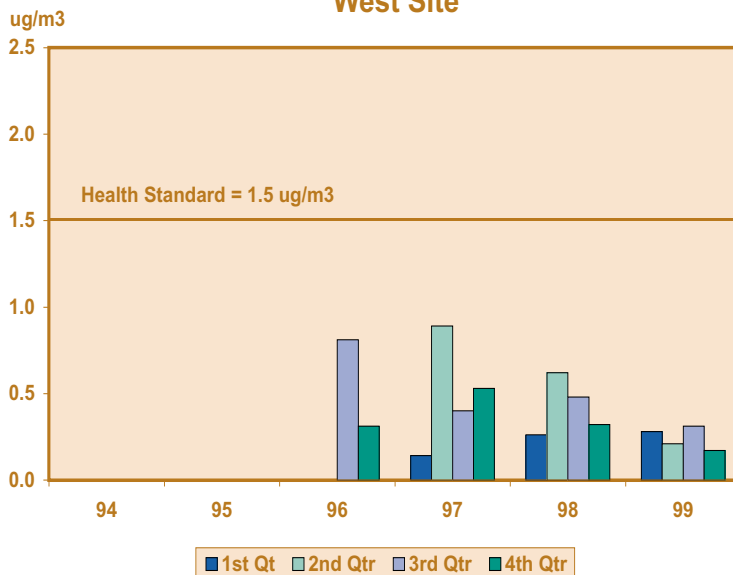
**Doe Run Herculanum Smelter -
#7 Broad Street Site**



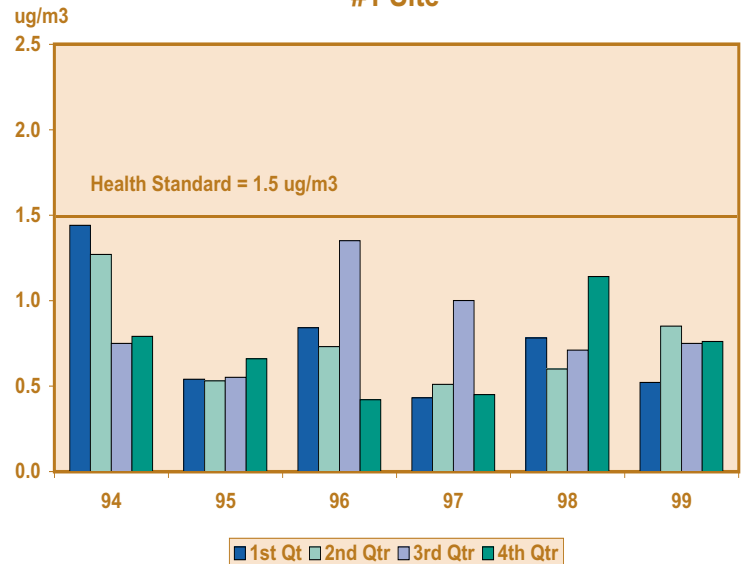
**Doe Run Glover Smelter -
#5 Big Creek Site**



**Schuylkill Smelter -
West Site**



**Doe Run Buick Smelter -
#1 Site**



Source: U.S. Environmental Protection Agency national AIRS database.

FINE PARTICULATE MATTER

PM_{2.5} is primarily generated from combustion sources. It can be emitted directly as particulate, or it can be formed from gases that are emitted, which combine or condense in the atmosphere to make particles. Sulfur or nitrogen compounds are likely to be significant in different areas of the country. In addition to the ambient monitoring currently being conducted, the department plans in the future to conduct sampling that could be analyzed for specific compounds or species of compounds. This would help

determine what types of sources are most responsible for PM_{2.5} levels in different parts of the state.

The time schedule for the PM_{2.5} standard to be implemented and attained will take several years because a new monitoring system for this type of pollution must be created. Based on EPA guidance, Missouri has designed a monitoring network of 30 monitors. By the end of 1999, 20 monitoring sites were in operation. The EPA will designate area attainment by 2003 based on three years of gathered data beginning in 2000.

1999 PM_{2.5} Data Summary

24-Hr std = 65ug/m³, 98 Percentile

Annual Mean Std. = 15µg/m³

Maximum Values

| Site Name | 1st | 2nd | 3rd | 4th | Annual Mean |
|------------------------------|------|------|------|------|-------------|
| West Alton | 43.7 | 40.7 | 38.0 | 29.9 | 14.2 |
| Margaretta | 49.4 | 49.3 | 45.3 | 44.9 | 15.1 |
| Blair Street | 64.5 | 50.9 | 49.4 | 47.7 | 17.3 |
| Florissant Valley | 46.9 | 44.9 | 42.1 | 32.7 | 14.6 |
| Clayton | 55.7 | 46.7 | 45.3 | 31.2 | 15.6 |
| Arnold | 46.5 | 45.4 | 41.5 | 31.5 | 15.2 |
| Liberty | 28.9 | 27.2 | 26.7 | 25.6 | 11.2 |
| North Kansas City | 37.3 | 32.7 | 31.7 | 31.5 | 12.2 |
| Sugar Creek | 36.2 | 30.7 | 30.0 | 29.9 | 11.7 |
| Locust | 34.9 | 30.6 | 29.5 | 29.2 | 14.0 |
| Richards-Gebaur | 30.1 | 27.6 | 26.5 | 26.5 | 11.0 |
| Eldorado Springs | 31.2 | 29.9 | 24.7 | 24.4 | 11.3 |
| Mark Twain State Park | 38.9 | 36.3 | 32.5 | 29.0 | 11.1 |
| Ste. Genevieve | 42.1 | 40.4 | 36.7 | 29.0 | 13.8 |
| SW Missouri State University | 35.0 | 31.4 | 30.4 | 27.2 | 12.2 |
| Mountain View | 50.2 | 35.1 | 33.5 | 29.3 | 13.1 |
| St. Joseph | 30.8 | 28.9 | 28.2 | 27.6 | 12.5 |
| Carthage Stone | 37.7 | 32.9 | 26.7 | 25.8 | 13.1 |

All units are in µg/m³

About The Air Pollution Control Program

The mission of the Department of Natural Resources' Air Pollution Control Program is "to maintain purity of the air resources of the state to protect the health, general welfare and physical property of the people, maximum employment and the full industrial development of the state." The program serves the public with technology, planning, enforcement, permitting, financial and information services to achieve this mission.

Technical Support

The program's staff looks at the quality of the air in Missouri using chemistry, meteorology, mathematics and computer modeling. Staff members research the sources and effects of air pollution, collecting and maintaining an annual inventory of sources that give off air pollution. In conjunction with the Department of Natural Resources' Environmental Services Program and four local agencies, the Air Pollution Control Program staff designs and coordinates an air-monitoring network and examines monitoring data. The network provides air quality data from more than 40 locations around the state. Using the monitoring data and other data on source emissions and the weather, the staff runs computer models of the atmosphere to predict air quality.

Planning

The program's staff develops rules and plans designed to protect and improve Missouri's air quality. Public participation is a vital part of the cooperative process of developing

guidelines and regulations. The staff works with businesses, federal, state and local government agencies, environmental groups and the public to exchange ideas and information on clean air issues with advisory groups, workgroups and workshops.

The staff works closely with EPA as part of the national effort to improve air quality through the Clean Air Act. The staff research and study complex environmental issues to develop air pollution control strategies that will allow Missouri's progress toward achieving and maintaining healthy air quality improvements. These air pollution control strategies are included in the **state implementation plan (SIP)** to control specific pollutants. The **Missouri Air Conservation Commission** (*see p. 31*) approves the **state implementation plan** and rule actions after they have gone through a public hearing process. When the **Missouri Air Conservation Commission** adopts rules, they become effective through publication in the *Missouri State Code of Regulations*. The **state implementation plan** and associated rules adopted by the **Missouri Air Conservation Commission** are submitted to EPA for inclusion in the federally approved state plan.

Permits

The program's staff reviews construction permit applications of new or modified emission sources to make sure that facilities minimize the release of air contaminants and will meet the requirements of the state and federal law and regulations.

Operating permit applications, similar to business licenses, are also received and issued. Operating permits staff identifies all the air pollution control requirements of a source of air pollution.

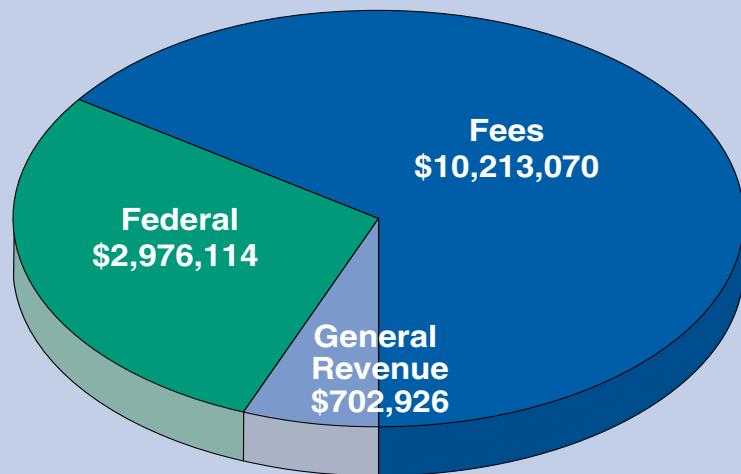
Enforcement

The program, through the department's regional offices, responds to complaints about air quality and help businesses comply with various federal, state and local rules. Staff conducts routine site inspections and oversees the testing of smokestacks, asbestos removal, gasoline vapor recovery equipment and other sources of air pollution. When a source violates an air quality requirement, the staff works with the facility to correct the problem and may take additional action, including the assessment of penalties necessary to obtain compliance with the requirement. Cases that cannot be resolved are referred to the Missouri Attorney General's office through the **Missouri Air Conservation Commission**.

Administration

The program's staff provides budgeting, procurement, public information and personnel services. The staff also provides liaisons for the **Missouri Air Conservation Commission**, EPA, the Missouri Department of Health, local air agencies in Kansas City, St. Louis, St. Louis County and Springfield, the American Lung Association and the news media.

2002 Revenue by Source



Total: \$13,892,110

2002 Revenue by Source

The Air Pollution Control Program receives funds from three sources: general tax revenue approved by the Missouri General Assembly, federal funds from EPA and four types of fees collected by the program. Since 1972, the program collected fees from businesses seeking permits to build new or modify existing emission sources. Since 1984, the state collected a fee to test the emissions of 1.2 million motor vehicles in the city of St. Louis and in Franklin, Jefferson, St. Charles and St. Louis counties. In 2000, an enhanced inspection program was initiated in all of these counties except Franklin, which still uses the basic test. Since 1993, the program collected an emission fee from air pollution sources under the Missouri Air Conservation Law. Since 1989, the program collected fees to

ensure the safe removal of asbestos; a cancer-causing substance of combined materials once used to insulate buildings. Funds received by the program are shown in the table above.

Local Agencies

A city or county may have its own air agency under two conditions: the city must be able to enforce its rules and its rules must be as strict as the state's. Local agencies issue permits, maintain their own monitoring networks and may enforce asbestos-removal laws. The local agencies are partially funded by EPA through the Department of Natural Resources. Four local governments in Missouri practice regional control over air pollution: Kansas City, St. Louis, St. Louis County and Springfield.

Missouri Air Conservation Commission

Created by the Missouri General Assembly in 1965, the Missouri Air Conservation Commission (MACC) has seven members appointed by the governor. The commission carries out the Missouri Air Conservation Law (Chapter 643, Revised Statutes of Missouri). The primary duty of the commission is to achieve and maintain the National Ambient Air Quality Standards established by the EPA. When the quality of the air meets these standards, an area is said to be in attainment. If monitors detect too much of one pollutant, however, the area is a nonattainment area for that pollutant.

Members serve four-year terms and the commission meets at least nine times per year. All meetings are open to the public and comments are welcome. Most meetings include public hearings where rule actions, state implementation plans and other matters are heard.

At meetings, the commission adopts, amends and rescinds rules; hears appeals of enforcement orders and permit conditions; initiates legal action to enforce rules; assigns duties to local air pollution control agencies; classifies regions as attainment or nonattainment areas and approves plans to meet national standards in nonattainment areas.

Notices of public hearings are published in the public-notice sections of these newspapers: *Columbia Daily Tribune*, *Poplar Bluff Daily American Republic*, *Springfield News-Leader*, *The Kansas City Star*, *St. Joseph News Press*, *St. Louis Post-Dispatch* and *the Kirksville Daily Express*. Proposed rules are published in the *Missouri Register*. To be placed on a mailing list to receive notice of public hearings and meetings, you may contact the Air Pollution Control Program at (573) 751-4817.

Information on public hearings and Missouri Air Conservation Commission meetings is also available on our home page at (www.dnr.state.mo.us/dnr/apcp).



MACC members, left to right: Frank Beller, Harriet Beard, Andy Farmer, Joanne Collins, David Zimmermann, and Barry Kayes. Not pictured: Michael Foresman.

Mel Carnahan
Governor
State of Missouri

1999 Missouri Air Conservation Commission

Barry Kayes
Chair

David Zimmermann
Vice-chair

Harriet Beard
Frank Beller
Joanne Collins
Andy Farmer
Michael Foresman

Steve Mahfood
Director
Department of
Natural Resources

John Young
Director
Division of
Environmental Quality

Roger D. Randolph
Director
Air Pollution
Control Program



STATE IMPLEMENTATION PLAN/AIR QUALITY PLANS

DNR's Air Pollution Control Program submits rules to the Missouri Air Conservation Commission (MACC) and writes the State Implementation Plan and air quality plans that indicate how Missouri will achieve and maintain the federal standards for ozone and other pollutants.

The State Implementation Plan is the primary method for achieving National Ambient Air Quality Standards (NAAQS) for compliance with the Clean Air Act. Distinct air quality plans are developed for specific air pollutants. Whenever concentrations of one of these pollutants exceed federal standards a plan is developed to bring the concentration into compliance. Plan development includes a new inventory of emission levels, computer modeling of emissions' sources and the effects of emission sources, control strategies and regulatory requirements or rules.

Another type of air quality plan, called a "State Plan," also involves an emission inventory, controls and rules, but addresses emission source types as well as specific pollutants.

The MACC adopted the following four plan actions in 1999:

Section 111(d) and 129 Plan for Implementing the Hospital, Medical/Infectious Waste Incinerator Emission Guidelines for Missouri

This new statewide plan implements the U.S. Environmental Protection Agency's (EPA) New Source

Performance Standards and Emissions Guidelines for hospital and medical/infectious waste incinerators.

Fifteen Percent Rate-of-Progress Plan* (St. Louis Ozone Nonattainment Area)

This revised plan incorporated recent amendments to volatile organic compound regulations, added reformulated gasoline and amended the portions of the plan related to the enhanced vehicle inspection and maintenance program.

Inspection/Maintenance Plan* (St. Louis Ozone Nonattainment Area)

This revised plan addressed all the issues that the U.S. EPA raised on the first submittal of the revised plan during August 1997. It includes a signed inspection/maintenance contract, signed Memorandums of Understanding with the Missouri State Highway Patrol and the Missouri Department of Revenue, an amended inspection/maintenance rule, proof of funding and a description of the inspection/maintenance program.

Attainment Demonstration Plan* (St. Louis Ozone Nonattainment Area)

This revised plan documented and summarized the results of air quality modeling used to determine the impact of local and regional air pollution control measures on ozone concentrations.

**These plans are part of the Missouri State Implementation Plan*

1999 Rules Update

In 1999, the Missouri Air Conservation Commission adopted 28 rule actions. All state rules can be viewed at mosl.sos.state.mo.us/csr/csr.htm. The following list highlights a few of the most significant rules adopted:

| | |
|---|--|
| 10 CSR 10-3.090 Restriction of Emission of Odors | Under this rule amendment, Class 1A Concentrated Animal Feeding Operations (CAFOs) are no longer exempt from existing odor emission regulations. Also, Class 1A CAFOs are now required to prepare and implement an odor control plan at each facility to restrict emission of odors. This specific amendment applies to the outstate areas of Missouri. Identical requirements were adopted for the St. Louis, Kansas City and Springfield areas. |
| 10 CSR 10-5.510 Control of Emissions of Nitrogen Oxides | This new rule requires all major sources of nitrogen oxides within the St. Louis ozone nonattainment area to implement reasonably available control technology (RACT) as required by the Clean Air Act. Affected sources include, but are not limited to, boilers, cement kilns, large stationary internal combustion engines and combustion turbines. |
| 10 CSR 10-5.520 Control of Volatile Organic Compound Emissions from Existing Major Sources | This new rule reduces emissions of volatile organic compounds from existing major sources throughout the St. Louis ozone nonattainment area. Major facilities that are not regulated by current RACT rules are required to conduct a RACT study and implement the findings of that study. |
| 10 CSR 10-6.200 Hospital, Medical, Infectious Waste Incinerators | This new rule establishes incinerator emission limits for metals, particulate matter, acid gases, organic compounds, carbon monoxide and opacity. The rule includes requirements for operator training and qualification, waste management, compliance and performance testing, monitoring and report/record keeping. |
| 10 CSR 10-6.070 New Source Performance Regulations, 10 CSR 10-6.075 Maximum Achievable Control Technology Regulations and 10 CSR 10-6.080 Emission Standards for Hazardous Air Pollutants | Under Title V of the Clean Air Acts Amendments, facilities emitting regulated air pollutants must obtain an operating permit. The state is required to adopt all applicable federal standards and enforce those standards as one of the conditions in the operating permits program. If the state fails to comply with these requirements, the EPA must implement a federal operating permits program. The amendments to 10 CSR 10-6.070 New Source Performance Regulations, 10 CSR 10-6.080 Maximum Achievable Control Technology Regulations and 10 CSR 10-6.080 Emission Standards for Hazardous Air Pollutants are a direct result of that requirement. Since 1980, Missouri has been granted delegation of updates to 40 CFR, Part 60 and 61 subparts, and incorporated these updates into regulation 10 CSR 10-6.070 and 6.080. The state has also requested delegation of 40 CFR Part 63 subparts on an annual basis since 1996 for regulation 10 CSR 10-6.075. These regulations incorporate by reference emission standards and performance criteria for new or modified stationary sources of hazardous air pollutants. Additionally, these regulations shift the responsibility for enforcement of those federal regulations to the state. |
| 10 CSR 10-6.230 Administrative Penalties | This rule was rescinded and readopted with revised administrative penalty procedures that are consistent with state statutes and other Division of Environmental Quality administrative penalties rules. |
| 10 CSR 10-6.060 Construction Permits Required | This rule amendment streamlined the construction permit review process. It established a fixed fee for portable relocations, created a permit-by-rule exemption, established a negligible-emission-level exemption, aligned major reviews with federal regulations and clarified modeling requirements. |

Air Quality Information

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Air Pollution Control Program.....(573) 751-4817

P.O. Box 176 Jefferson City, MO 65102-0176

Technical Assistance Program.....1-800-361-4827

General DNR Information.....1-800-334-6946

Relay Missouri (for use by the hearing impaired)1-800-735-2966

Jefferson City Regional Office.....(573) 751-2729

Kansas City Regional Office.....(816) 554-4100

Northeast Regional Office (Macon).....(660) 385-2129

St. Louis Regional Office.....(314) 301-7100

Southeast Regional Office (Poplar Bluff).....(573) 840-9750

Southwest Regional Office (Springfield).....(417) 891-4300

IN CASE OF AN ENVIRONMENTAL EMERGENCY:

Missouri Department of Natural Resources

Emergencies only 24 hours a day(573) 634-2436

Emergency Response Office weekdays(573) 526-3315

U.S. Environmental Protection Agency - Region VII.....(913) 551-7020

National Response Center1-800-424-8802

(A service of the U.S. government for reporting oil and chemical spills)

CHEMTREC1-800-424-9300

(A service of the chemical industry for reporting chemical spills, leaks and fires)

OTHER AIR QUALITY ORGANIZATIONS:

Missouri Department of Health.....(573) 751-6400

St. Louis Regional Clean Air Partnership.....(314) 645-5505

Heartland Sky (Kansas City).....(816) 474-4240

American Lung Association of Eastern Missouri(314) 645-5505

American Lung Association of Western Missouri(816) 842-5242

Kansas City Health Department.....(816) 513-6314

City of St. Louis - Division of Air Pollution Control(314) 613-7300

St. Louis County - Department of Health(314) 615-8923

Springfield-Greene County - Air Pollution Control Authority.....(417) 864-1662

AIR POLLUTION INFORMATION ON THE INTERNET

There is a wealth of information about air quality issues on the Internet. You may find some of the following World Wide Web addresses helpful (addresses were correct at the date of this publication):

MISSOURI DEPARTMENT OF NATURAL RESOURCES

| | |
|--|--|
| Air Pollution Control Program | (www.dnr.state.mo.us/deq/apcp) |
| Technical Assistance Program | (www.dnr.state.mo.us/deq/tap) |
| General DNR Department Information | (www.dnr.state.mo.us) |
| The complete Missouri Air Law | (www.moga.state.mo.us/statutes/c643.htm) |
| DNR - Air Quality Monitoring | (www.dnr.state.mo.us/deq/esp) |
| Code of State Regulations | (mosl.sos.state.mo.us/csr/csr.htm) |

U.S. ENVIRONMENTAL PROTECTION AGENCY

| | |
|--|--|
| EPA Region VII (Kansas City) | (www.epa.gov/region07/) |
| Office of Air and Radiation | (www.epa.gov/oar/) |
| Air Links - EPA Air Quality Publications | (www.epa.gov/airlinks/) |

OTHER AIR QUALITY ORGANIZATIONS:

| | |
|--|--|
| St. Louis Regional Clean Air Partnership | (www.cleanair-stlouis.com/) |
| Heartland Sky (Kansas City) | (www.marc.org/heartsky.htm) |
| American Lung Association | (www.lungusa.org/) |
| Air and Waste Management Association | (www.awma.org/) |
| Missouri Department of Health | (www.health.state.mo.us/) |

DAILY AIR QUALITY FORECASTS:

| | |
|-------------------|--|
| Kansas City | (www.marc.org/airquality/airqual.htm#skycast) |
| St. Louis | (www.cleanair-stlouis.com/4cast.htm) |

GLOSSARY

Attainment: The designation given to an area that meets all National Ambient Air Quality Standards.

Carbon monoxide (CO): A poisonous gas that is odorless, colorless and tasteless. At low levels it causes impaired vision and manual dexterity, weakness and mental dullness. At high levels it may cause vomiting, fast pulse and breathing followed by a slow pulse and breathing, then collapse and unconsciousness.

Inhalable particles (PM₁₀ and PM_{2.5}): A broad class of particles sometimes simply referred to as “soot.” One of the “criteria pollutants,” PM₁₀ particles are 10 microns or smaller in diameter. The pollutant increases the likelihood of chronic or acute respiratory illness. It also causes difficulty in breathing, aggravation of existing respiratory or cardiovascular illness and lung damage. In addition it causes decreased ability to defend against foreign materials. New laws have just been passed regulating PM_{2.5}, an even smaller and more harmful class of fine particles less than 2.5 microns in diameter. Missouri is beginning to monitor its concentrations.

Lead (Pb): Airborne lead appears as dust-like particles ranging from light gray to black. Low doses may damage the central nervous system of fetuses and children, causing seizures, mental retardation and behavioral disorders. In children and adults, lead causes fatigue, disturbed sleep and decreased fitness, and it damages the kidneys, liver and blood-forming organs. It is suspected of causing high blood pressure and heart disease. High levels damage the nervous system and cause seizures, comas and death.

Missouri Air Conservation Commission: The governor appoints this seven-member group. The commission carries out the Missouri Air Conservation Law (Chapter 643, Revised Statutes of Missouri). The primary duty of the commission is to help Missouri achieve the National Ambient Air Quality Standards set by the Environmental Protection Agency.

National Ambient Air Quality Standards (NAAQS): Standards set by the U.S. Environmental Protection Agency (EPA) that limit the amount of six air pollutants allowed in outside air. These six are carbon monoxide, inhalable particles, lead, nitrogen dioxide, ozone and sulfur dioxide. The limits are based on what is safe for humans to breathe.

Nitrogen dioxide (NO₂): A poisonous, reddish-brown to dark brown gas with an irritating odor. It can cause lung inflammation and can lower resistance to infections like bronchitis and pneumonia. It is suspected of causing acute respiratory disease in children.

Nonattainment area: A region in which air monitors detect more of a pollutant than is allowed by the National Ambient Air Quality Standards set by the U.S. EPA. The U.S. EPA may designate a region as a “nonattainment area” for that pollutant.

Ozone (O₃): Three atoms of oxygen; a colorless gas with a pleasant odor at low concentrations. The layer of ozone in the atmosphere protects the earth from the sun’s harmful rays. Ground-level ozone is a summertime hazard produced when hydrocarbons from car exhaust and other fumes mix in the presence of sunlight with oxides of nitrogen from power plants and other sources. Ozone is more easily recognized in smog, a transparent summer haze that hangs over urban areas. The result is a gas that aggravates respiratory illness, makes breathing difficult and damages breathing tissues. Victims include people with lung disease, the elderly, children and adults who exercise outside.

Ozone Violation: Four or more exceedances of the federal ozone standard occurring in a three-year period at the same monitoring site.

Reformulated Gasoline (RFG): A fuel blend designed to reduce air toxins and volatile organic compound (VOC) emissions by decreasing the amount of toxic compounds such as benzene, lowering the evaporation rate and increasing the amount of oxygenate blended with the fuel.

State Implementation Plan (SIP): A plan submitted by the Missouri Department of Natural Resources to the Environmental Protection Agency for complying with national air quality standards. Each plan concerns one air pollutant for one nonattainment area.

Sulfur Dioxide (SO₂): A colorless gas with a strong, suffocating odor. Causes irritation of the throat and lungs and difficulty in breathing. It also causes aggravation of existing respiratory or cardiovascular illness.



***“We do not inherit the Earth from our fathers,
we are borrowing it from our children.”***

David Brower

PHOTO CREDITS:

*Cover picture, taken at the Gasconade River in Plulaski County, and Missouri Air Conservaton Commission Photographs
by Van Beydler, Missouri Department of Natural Resources.*

Arch photograph, page 1, by Nick Decker, Missouri Department of Natural Resources.

*Charcoal Kiln pictures, Air Quality Highlights, by Peter Yronwode, Missouri Department of Natural Resouces—
Air Pollution Control Program .*



Missouri Department of Natural Resources Air Pollution Control Program

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